Amplifier 70FA890/00R/05R

Service
Service
Service

Service Manual

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

Documentation Technique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Serviço

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

Subject to modification
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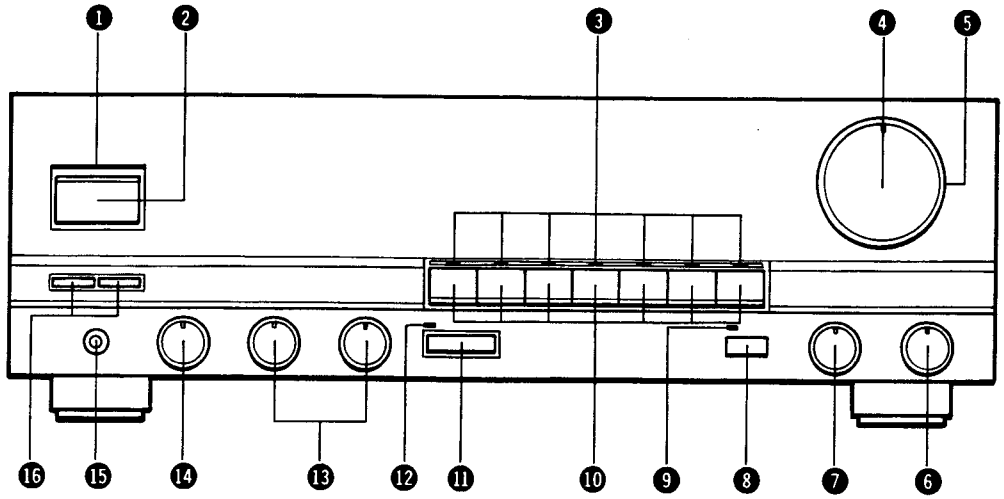
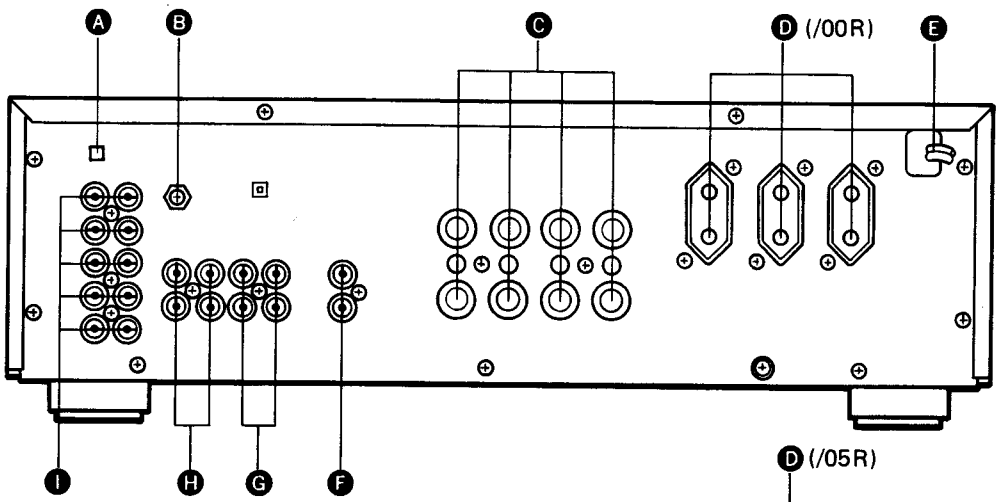
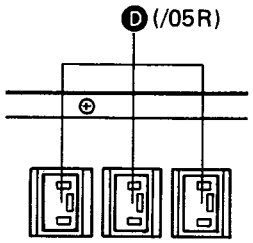
CS 29 273

SPECIFICATION

General	Nominal value	Typical value
Mains voltage	: 220V ~ (/00R) : 240V ~ (/05R)	: 220V ~ (/00R) : 240V ~ (/05R)
Mains frequency	: 50 – 60 Hz	: 50 – 60 Hz
Power consumption	: 340W	: 340W
Dimensions (WxHxD)	: 420 x 118 x 334 mm	: 420 x 118 x 334 mm
Weight	: 9.2 kg	: 9.2 kg
Amplifier		
Output power	: 80W in 8Ω (IEC)	: 85W in 8Ω (IEC)
Distortion		
T.H.D.	: ⩽ 0.03% at 1 kHz : ⩽ 0.03% at 63 Hz – 12.5 kHz } (IEC)	: ⩽ 0.002% at 1 kHz : ⩽ 0.01% at 63 Hz – 12.5 kHz } (IEC)
Intermodulation	: ⩽ 0.03% at 60/7000 Hz 4:1	: ⩽ 0.006% at 60/7000 Hz 4:1
Frequency characteristic		
Phono input (tone control)	: from 20 Hz – 20 kHz ±1 dB (IEC/RIAA)	: from 20 Hz – 20 kHz ±0.5 dB (IEC/RIAA)
Other inputs (neutral)	: from 10 Hz – 50 kHz ±1 dB	: from 10 Hz – 60 kHz ±1 dB
Bass control	: at 100 Hz +10 dB to –10 dB ±1 dB	: at 100 Hz +10 dB to –10 dB
Treble control	: at 10 kHz +10 dB to –10 dB ±1 dB	: at 10 kHz +10 dB to –10 dB
Loudness	: at 100 Hz +6 dB ±1 dB : at 10 kHz +4 dB ±1 dB } Tap position	: at 100 Hz +6 dB : at 10 kHz +4 dB } Tap position
Signal/noise ratio weighted (A-curve)		
Phono input (MM)	: for 80W output ⩾ 80 dB (IEC)	: for 80W output ⩾ 83 dB (IEC)
(MC)	: for 80W output ⩾ 70 dB (IEC)	: for 80W output ⩾ 72 dB (IEC)
Other inputs	: for 80W output ⩾ 85 dB (IEC)	: for 80W output ⩾ 89 dB (IEC)
Channel separation	: at 1000 Hz ⩾ 57 dB	: at 1000 Hz ⩾ 60 dB
	: at 250 Hz – 10 kHz ⩾ 45 dB	: at 250 Hz – 10 kHz ⩾ 50 dB
Input sensitivity/Input impedance		
Audio		
Phono (MM)	: 2.5 mV/47 kΩ	: 2.5 mV/47 kΩ
(MC)	: 250 μV/100Ω	: 250 μV/100Ω
Tuner/CD/Aux/Tape	: 150 mV/17 kΩ	: 150 mV/22 kΩ
TV/Video	: 150 mV/17 kΩ	: 150 mV/22 kΩ
Output level/Output impedance		
Tape	: 280 mV/450Ω (Phono 5 mV 1 kHz input)	: 280 mV/450Ω (Phono 5 mV 1 kHz input)







CONNECTIONS AND CONTROLS

1	Mains indicator	VZ01
2	Mains switch	S901
3	Function indicator	DU01÷DU05 DU08, DU09
4	Volume control	RG01
5	Volume illumination	VZ51, VZ52
6	Balance control	RG55
7	Loudness switch	SG51
8	IR sensor	QU07
9	Stand-by indicator	DU06
10	Function switch	SU01÷SU07
11	Source direct switch	SU08
12	Source direct indicator	DU07
13	Tone control	RE21, RE22
14	Rec selector switch	SE01
15	Headphone socket	JW51
16	LS switch	SW01

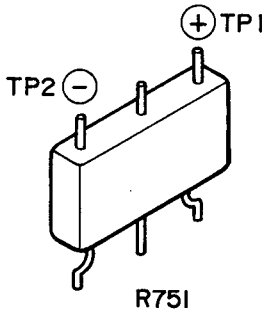
A	Phono selector switch	S401
B	Ground terminal	J031
C	LS outlet	J704, J705
D	AC outlet	(/00R) J951, J952, J953 (/05R) J021, J022, J023
E	Mains cord	W001
F	Remote in/out	JJ03
G	DAT/tape 2 play/rec.	JJ02
H	Tape 1 play/rec.	JJ01
I	Input	JV01, JV02

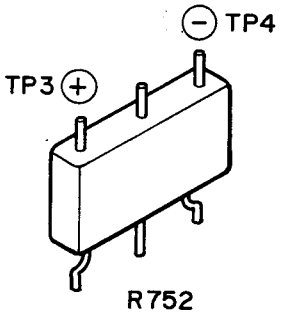
ADJUSTMENT

Idling Current

SK... SWITCH	SIGNAL	TO	VOLUME	ADJUST	OSCILLOSCOPE	D.C. METER INDICATOR
			Min.	Lch R733		Lch TP2(–), TP1(+) DC 10 mV (27.7 mA)
				Rch R734		Rch TP4(–), TP3(+) DC 10 mV (27.7 mA)

Polarity of the test points (R751, R752)





*See WIRING DIAGRAM (P701)

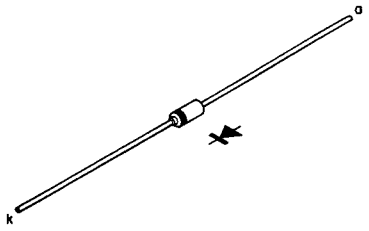
Carbon film 0.125 W or 0.2 W	70°C	5%	
Carbon film 0.25 W or 0.33 W	70°C	5%	
Metal film 0.25 W or 0.33 W	70°C	5%	
Carbon film 0.5 W	70°C	5%	
Carbon film 0.67 W	70°C	5%	
Carbon film 1 W or 1.15 W	70°C	5%	

Ⓒ Chip component

Ceramic plate Tuning ≤ 120 pF NP.0		2%
Ceramic plate Others		−20/+80%
Polyester flat foil		10%
Metalized polyester flat film		10%
Polyester flat foil small size (Mylar)		10%
Polysterene film/foil		1%
Tubular ceramic		
Miniature single		
Subminiature tantalum		± 20%

*a = 2.5 V
b = 3.15 V or 4 V
c = 6.3 V
d = 10 V
e = 16 V
f = 25 V
g = 40 V
h = 63 V
j = 100 V
l = 125 V
m = 150 V
n = 160 V
q = 200 V
r = 250 V
s = 300 V
t = 350 V
u = 400 V
v = 500 V
w = 630 V
x = 1000 V
A = 1.6 V
B = 6 V
C = 12 V
D = 15 V
E = 20 V
F = 35 V
G = 50 V
H = 75 V
I = 80 V

Semiconductor Layout



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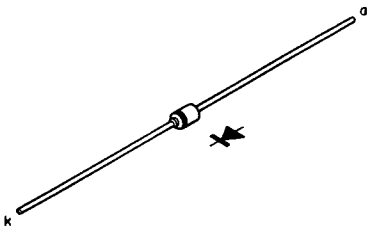
MA165
1SS254



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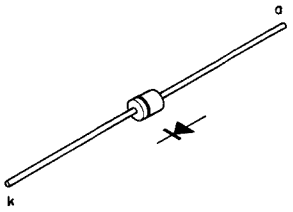

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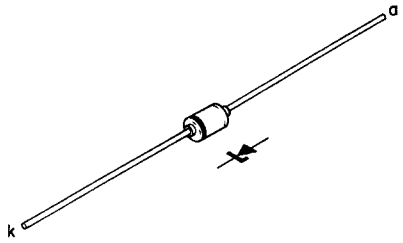

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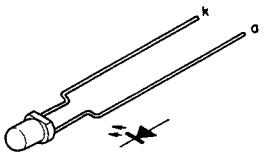
MTZJ15B
MTZJ8.2C



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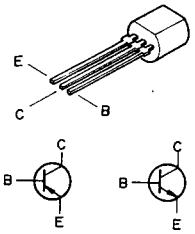

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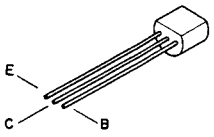

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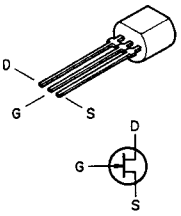
JC557B



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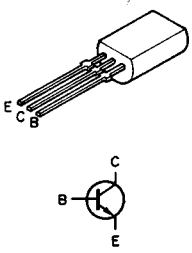

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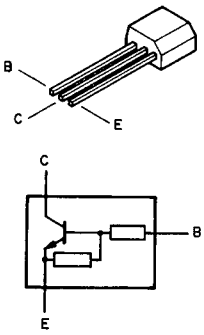

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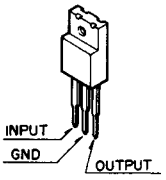

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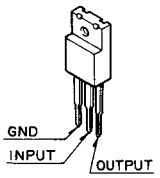

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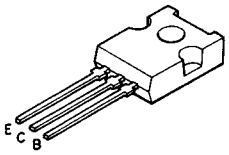

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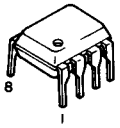

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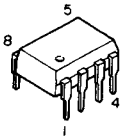

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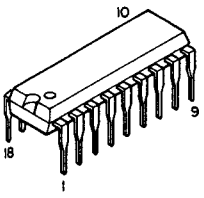

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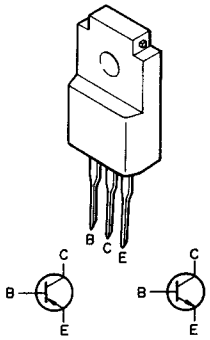

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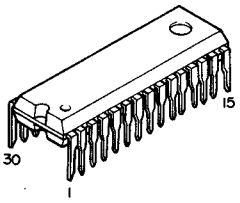

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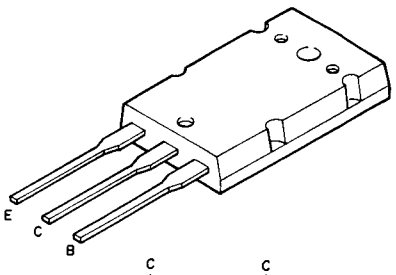

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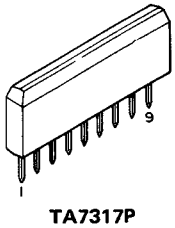

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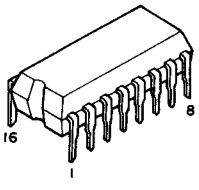

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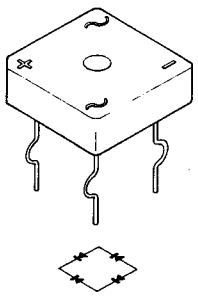

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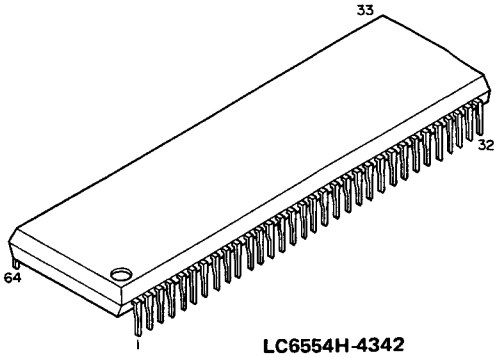

LC6554H-4342

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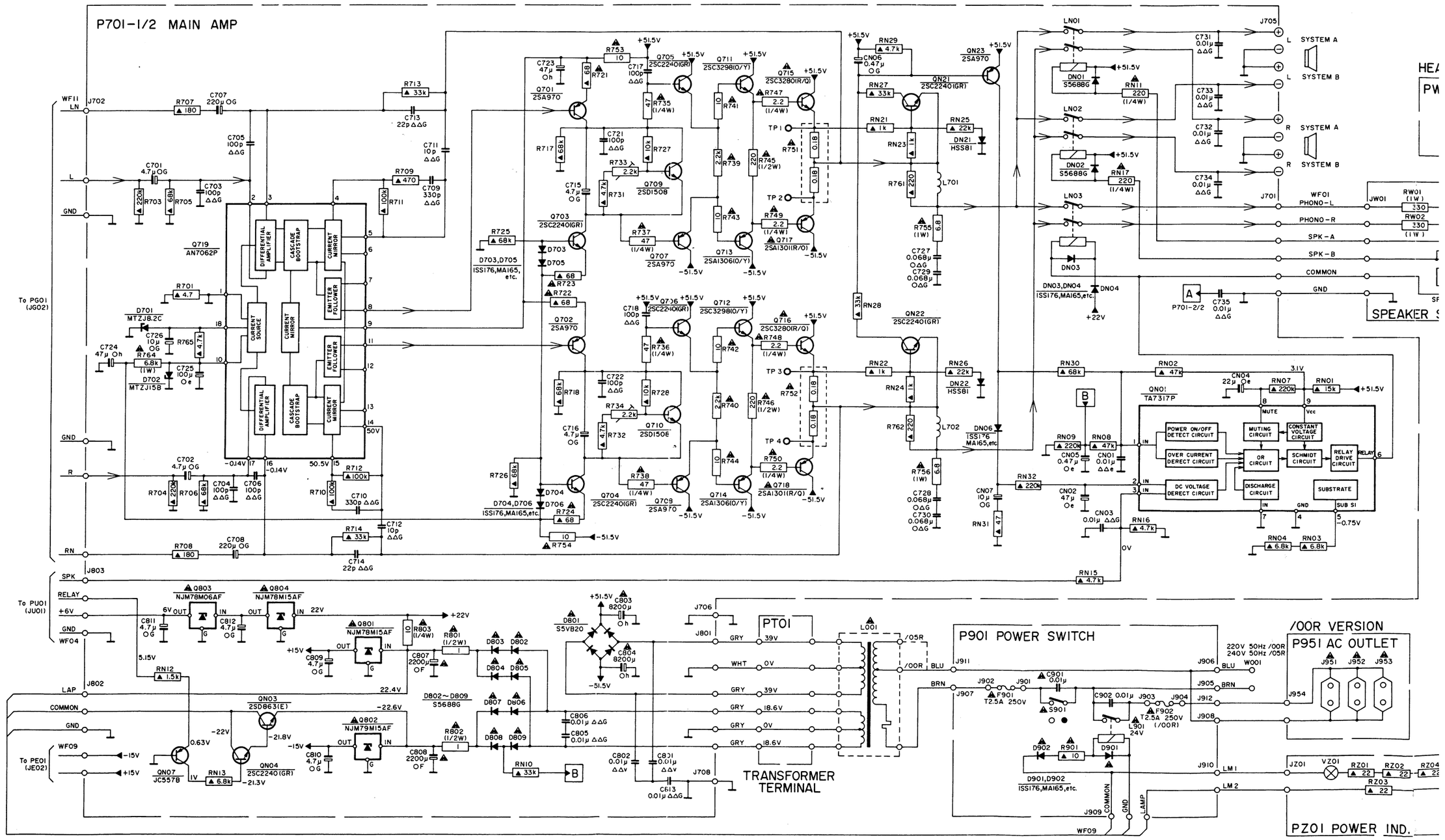
SCHEMATIC DIAGRAM

R	R703~R708 R711 R709 R713 R725 R717 R721~R724 R753 R735~R738 R739~R744 R745~R752 RN27~RN29 RN25 RN17 RN11 RW01 R764 R701 R765 R710 R712 R714 R726 R718 R731~R734 RN21~RN24 R755 RN26 RN30 RN09 RN08 RN02 RN07 RN01 RW02 RN12 RN13 R803 R801 R802 RN10 R754 R761 R762 R756 RN31 RN32 R901 RN15 RN16 RN04 RN03 RZ01~RZ04
C	C724~C726 C701~C708 C710 C712 C713 C711 C709 C723 C715 C716 C721 C722 C717 C718 CN06 C727~C730 CN05 CN01~CN03 C731~C735 C811 C812 C809 C810 C714 C807 C808 C806 C805 C801~C804 C813 CN07 C901 C902 CN04
Q	Q719 Q803 Q804 Q801 Q701~Q704 Q705~Q710 Q711~Q714 Q715~Q718 QN22 QN21 QN23 QN01 QN07 QN04 QN03 Q802
D	D701 D702 D802~D809 D703~D706 D801 DN21 DN22 DN06 D902 DN01~DN04 D901
F-L	L701 L702 F901 LN01~LN03 L901 F902
S-V	S901 VZ01



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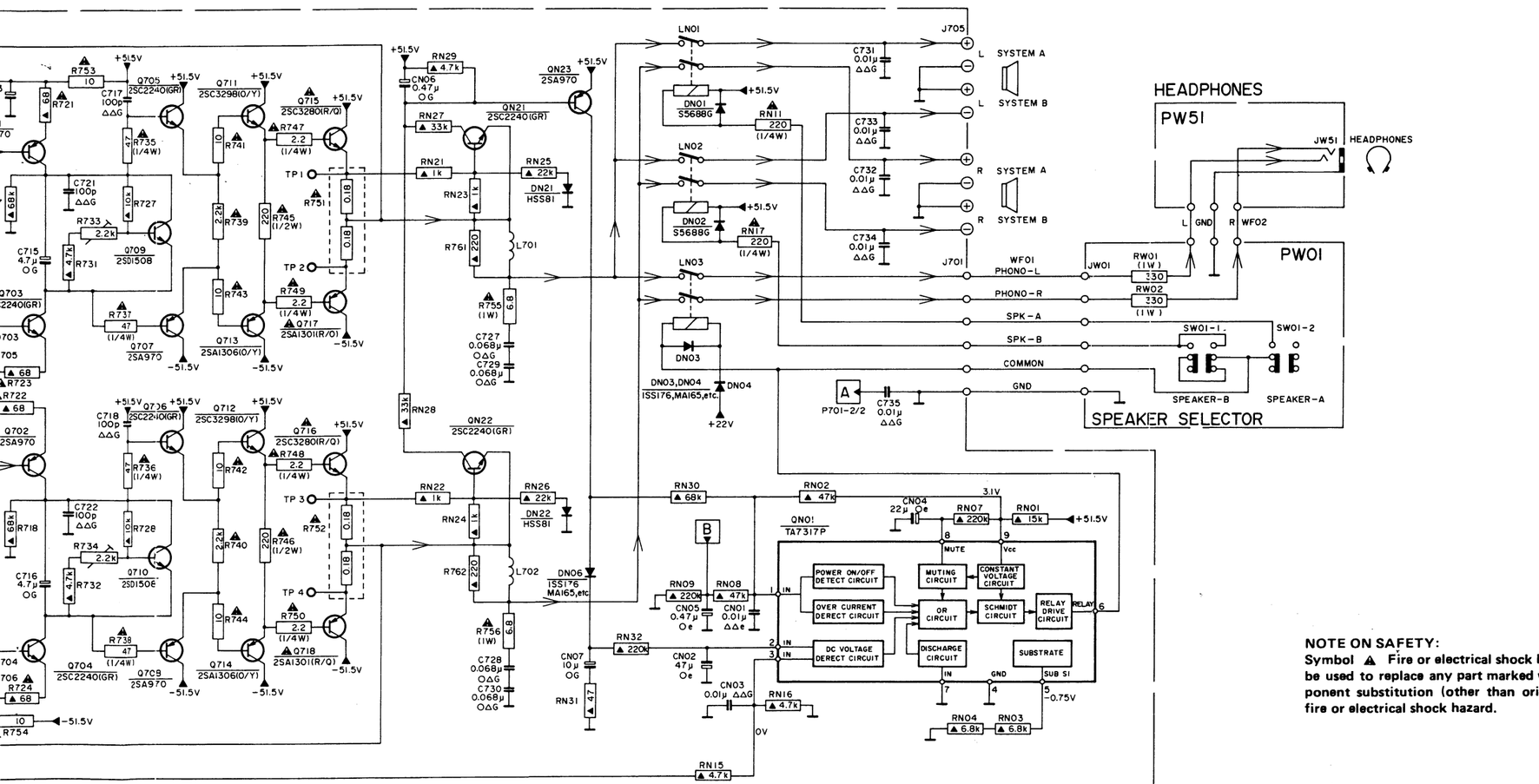
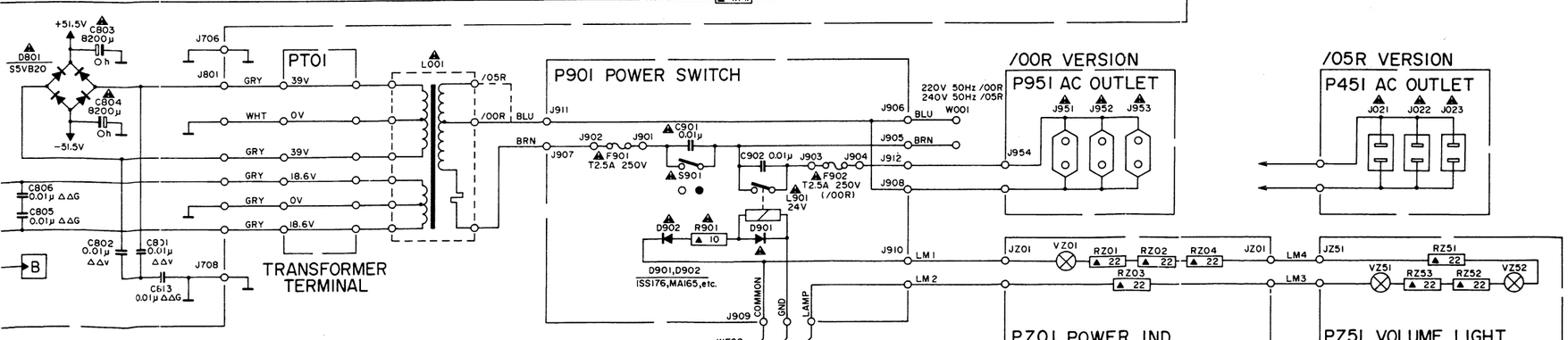
SCHEMATIC DIAGRAM

R721~R724 R753 R735~R738 R739~R744 R745~R752 RN27~RN29 RN25 RN17 RN11 RWC1 R731~R734 RN21~RN24 R755 RN26 RN30 RN09 RN08 RN02 RN07 RN01 RWC2 54 R761 R762 R756 RN31 RN32 R901 RN15 RN16 RN04 RN03 RZ01~RZ04 RZ51~RZ53	R
C715 C716 C721 C722 C717 C718 CN06 C727~C730 CN05 CN01~CN03 C731~C735 C806 C805 C801~C804 C813 CN07 C901 C902 CN04	C
~Q704 Q705~Q710 Q711~Q714 Q715~Q718 QN22 QN21 QN23 QN01	Q
703~D706 D801 DN21 DN22 DN06 D902 DN01~DN04 D901	D
L701 L702 F901 LN01~LN03 L901 F902	F-L
S901 VZ01 SW01 VZ51 VZ52	S-V



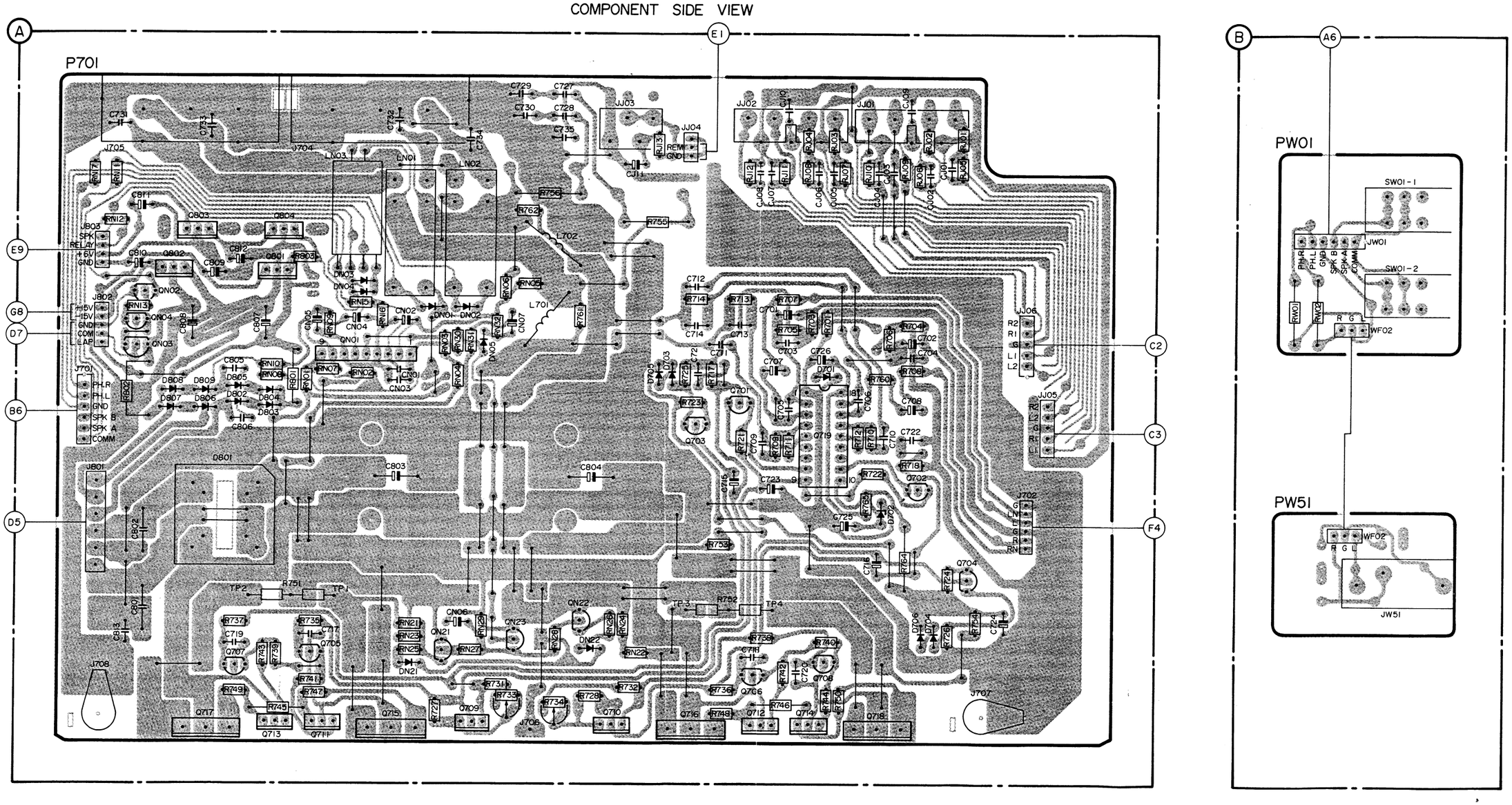


NOTE ON SAFETY:
Symbol ▲ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ▲ . Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

WIRING DIAGRAM

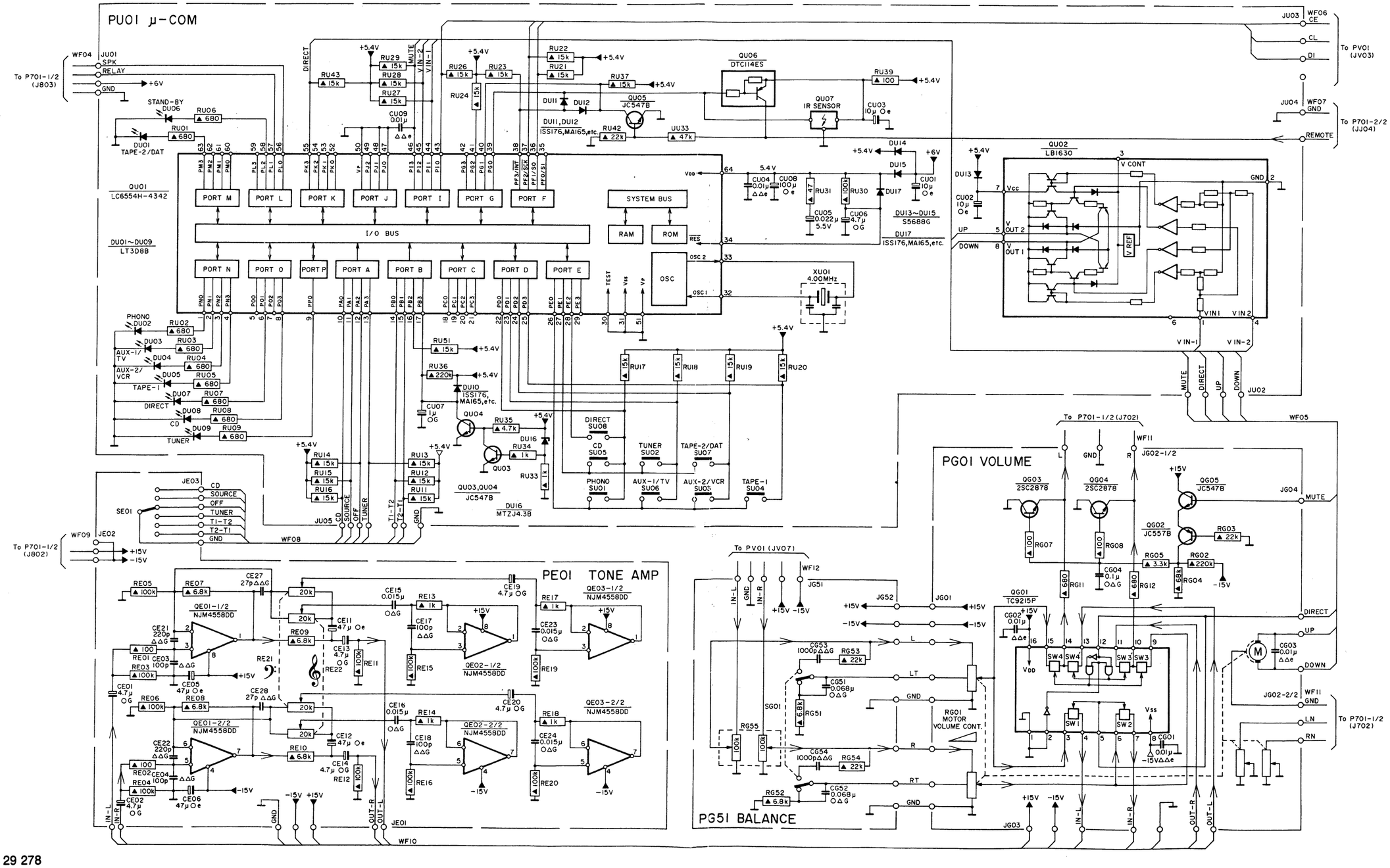
R	RNI7 RNI1 RNI2 R803 RN09 RNI5 RNI6 RN03 RN30～RN32 RN06 R762 RN05 R756 R761 R755 RJI3 RJI2 RJI1 RJ04 RJ08 RJ03 RJ07 RJI0 RJ09 RJ06 RJ02 RJ01 RJ05	R
	RNI3 RNI0 RN08 R801 RN01 RN07 RN02 RN04 R725 R714 R723 R717 R713 R701 R703～R708 R721 R709～R712 R722 R764 R760 R765 R718 RW01 RW02	
	R802 R737 R749 R743 R739 R745 R751 R735 R741 R747 RN21 RN23 RN25 R727 RN27 RN29 R731 R733 R734 RN28 R728 RN26 RN24 R732 RN22 R753 R752 R736 R748 R738 R746 R742 R740 R744 R750 R724 R726 R754	
C	C731 C810 C811 C733 C809 C812 C732 C734 C729 C730 C727 C728 C735 CJI1 CJ08 CJ07 CJI0 CJ06 CJ05 CJ04 CJ03 CJ09 CJ02 CJ01	C
	C808 C805～C807 CN01～CN05 C803 CN07 C804 C721 C711～C714 C701～C704 C705～C710 C726 C722	
	C813 C802 C801 C719 C717 CN06 C715 C718 C723 C720 C725 C716 C724	
Q	QN02～QN04 Q801～Q804 QN01 Q703 Q701 Q719 Q702 Q704	Q
	Q717 Q707 Q713 Q711 Q705 Q715 QN21 Q709 QN23 QN22 Q710 Q716 Q706 Q712 Q714 Q708 Q718	
D	D801～D809 DN03 DN04 DN21 DN01 DN02 DN05 DN22 D705 D703 D701 D702 D706 D704	D
L－S	LN03 LN01 LN02 L701 L702 SW01	L－S

COMPONENT SIDE VIEW



SCHEMATIC DIAGRAM

R	RU01~RU09 RU43 RU27~RU29 RU26 RU24 RU23 RU22 RU21 RU42 RU37 UU33 RU31 RU30 RU39 RU14~RU16 RU11~RU13 RU51 RU36 RU33~RU35 RU17~RU20	R
C	RE01~RE08 RE21 RE09~RE12 RE22 RE13~RE16 RE17~RE20 RG55 RG51~RG54 RG01 RG07 RG11 RG08 RG12 RG05 RG04 RG02 RG03 CE21 CE22 CE27 CU09 CU07 CE19 CE23 CU04 CU08 CU05 CU06 CU03 CU01 CU02 CE01~CE06 CE28 CE11~CE14 CE15~CE18 CE20 CE24 CG51~CG54 CG02 CG04 CG01 CG03	C
Q	QU01 QU04 QU03 QU05 QU06 QU07 QU02 QE01 QE02 QE03 QG01 QG03 QG04 QG02 QG05	Q
D	DU01~DU09 DU10 DU16 DU11 DU12 DU17 DU14 DU15 DU13	D
S-X	SE01 SU08 SU05 SU01 SU02 SU06 SU07 SU03 SU04 SG01 XU01	S-X



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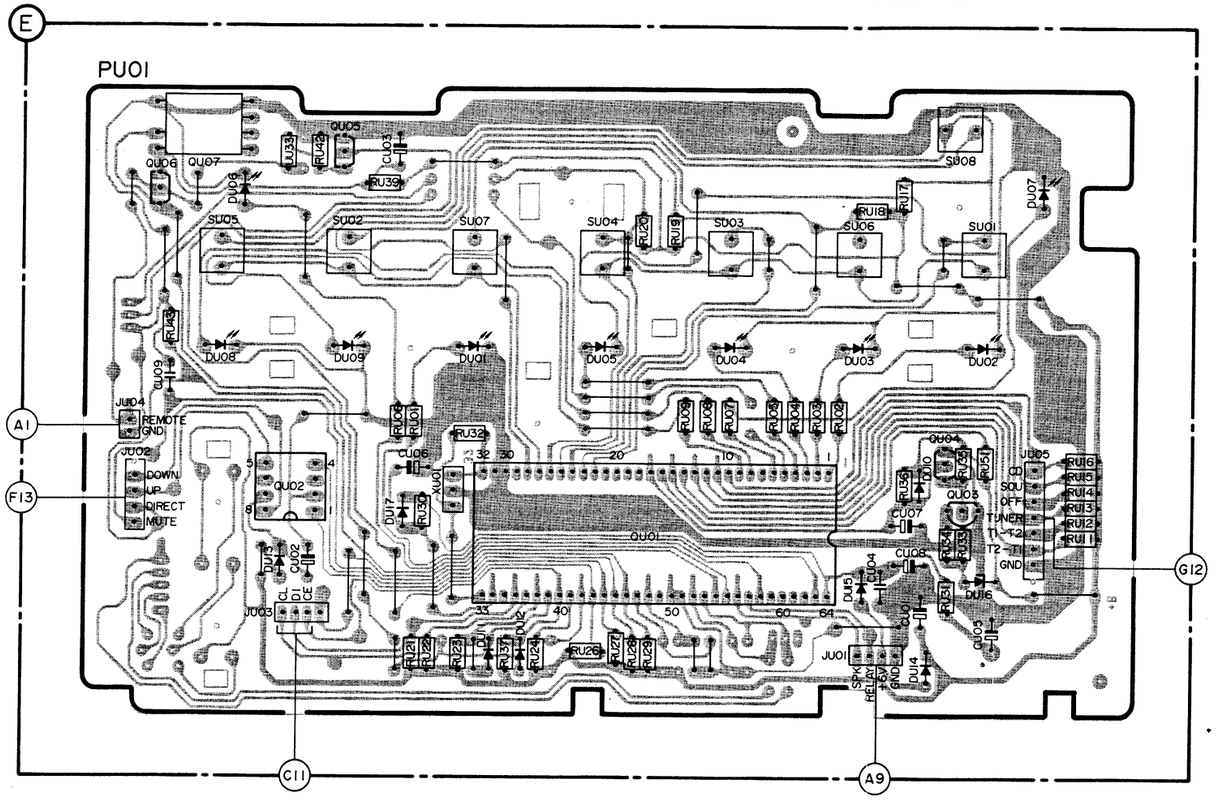
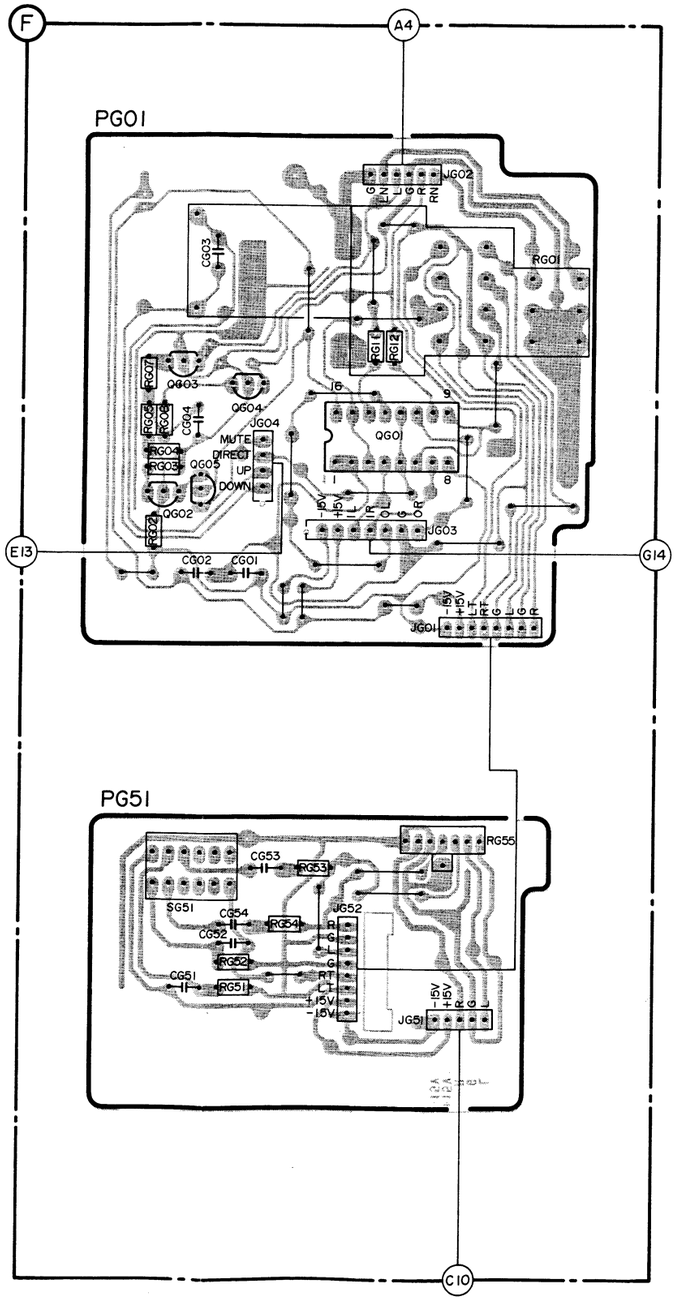
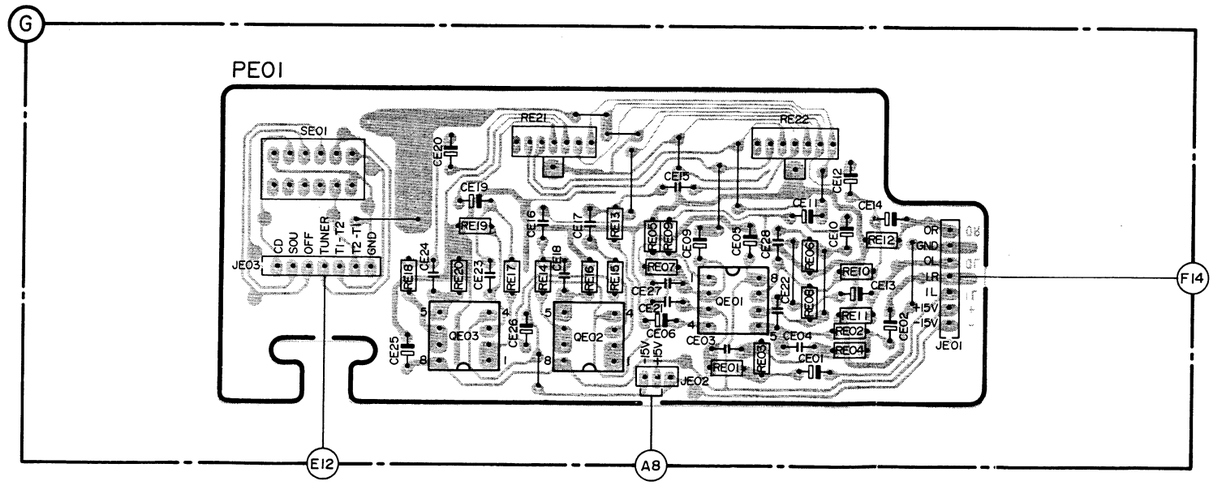
WIRING DIAGRAM

R	RU43 UU33 RU42 RU39 RU06 RU01 RU30 RU32 RU20 RU19 RU09 RU08 RU07 RU05 RU04 RU03 RU02 RU18 RU17 RG07 RG08 RG11 RG12 RG01	R
	RU21～RU24 RU37 RU26～RU29 RE22 RU36 RU31 RU34 RU33 RU35 RU51 RU11～RU16 RG02～RG05	
	RE18 RE20 RE19 RE17 RE14 RE16 RE15 RE13 RE05 RE09 RE07 RE01 RE03 RE06 RE08 RE02 RE04 RE10～RE12 RG52 RG51 RG54 RG53 RG55	
C	CU09 CU02 CU03 CU06 CU04 CU07 CU08 CU01 CU05 CG04 CG02 CG03 CG01	C
	CE25 CE24 CE20 CE19 CE23 CE26 CE16 CE18 CE17 CE27 CE21 CE06 CE15 CE09 CE03 CE05 CE28 CE22 CE04 CE01 CE10～CE14 CE02 CG51 CG52 CG54 CG53	
Q	QU06 QU07 QU02 QU05 QE03 QE02 QU01 QE01 QU04 QU03 QG02～QG05 QG01	Q
D	DU08 DU06 DU13 DU09 DU17 DU01 DU11 DU12 DU05 DU04 DU03 DU15 DU10 DU14 DU16 DU02 DU07	D
S－X	SU05 SE01 SU02 XU01 SU07 SU04 SU03 SU06 SU08 SU01 SG51	S－X

COMPONENT SIDE VIEW







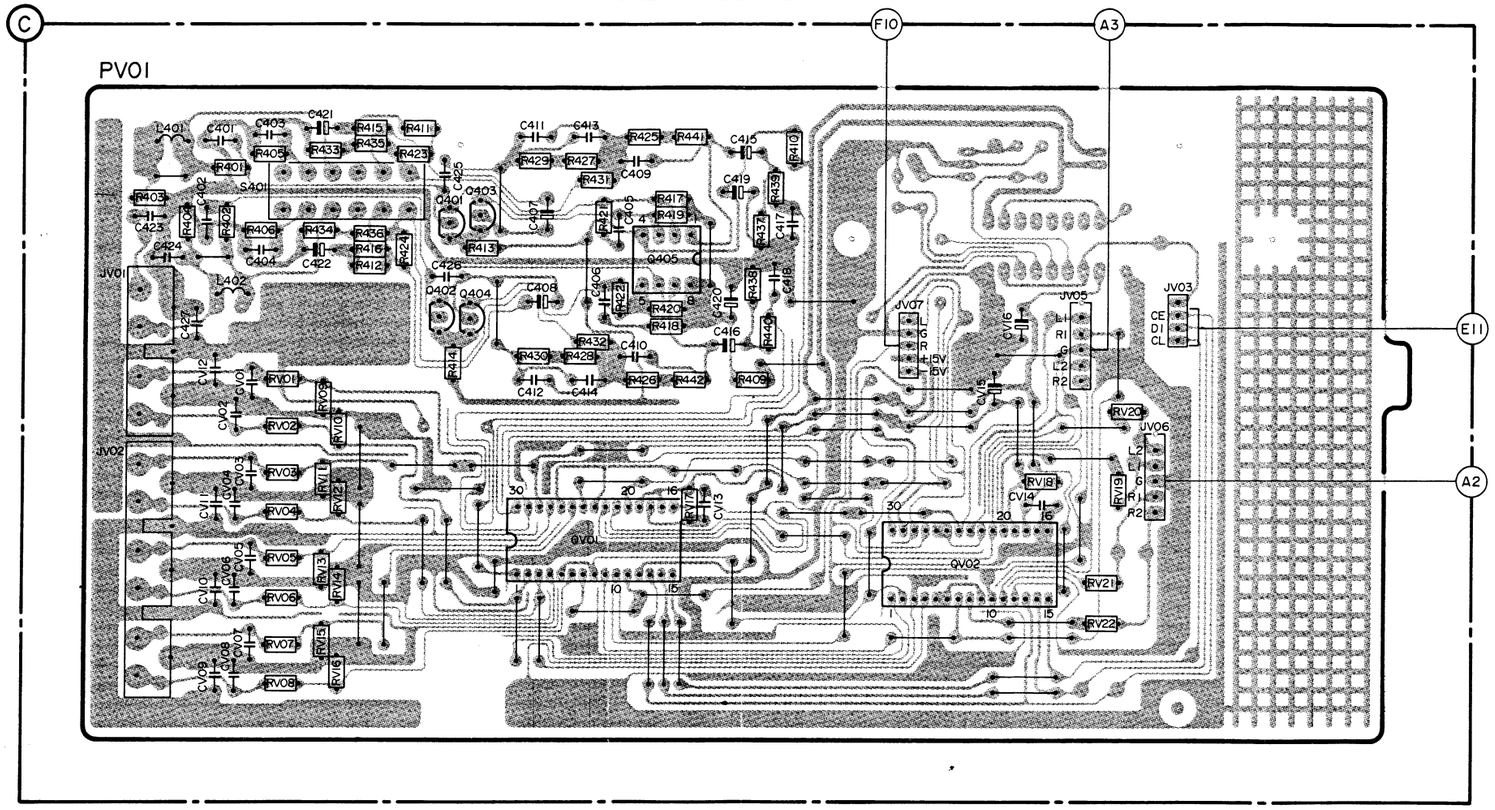
SCHEMATIC DIAGRAM

| | | |

WIRING DIAGRAM

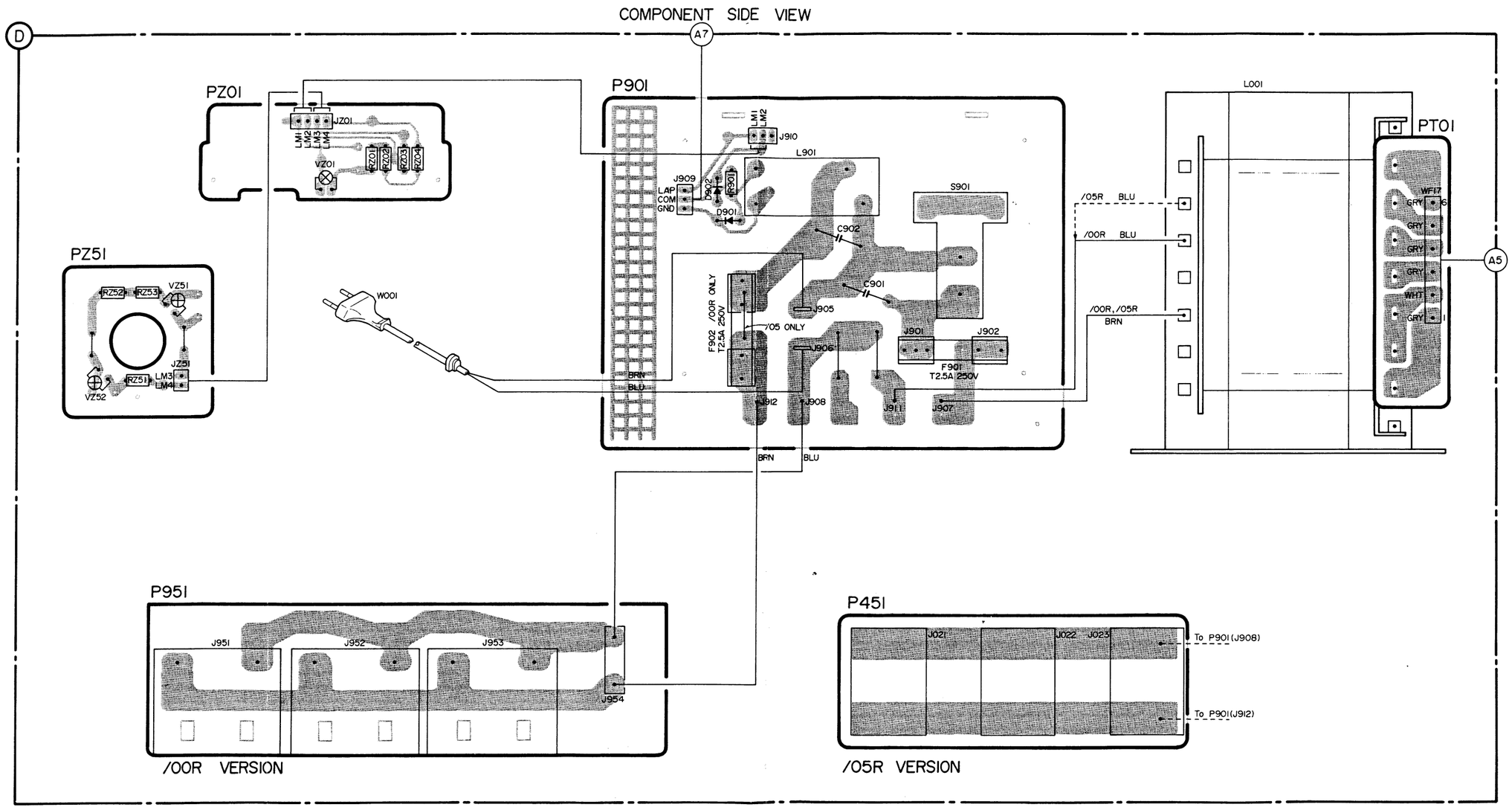
R	R403 R401 R405 R433～R436 R415 R423 R411 R414 R413 R429 R427 R431 R421 R425 R417 R419 R441 R437～R440 R410	R
	R404 R402 R406 RV01～RV16 R416 R412 R424 R430 R428 R432 R422 R426 R420 R418 R442 RV17 R409 RV18～RV22	
C	C423 C424 C401～C404 C421 C425 C411 C407 C413 C405 C409 C415～C420	C
	C427 CV01～CV12 C422 C426 C412 C408 C414 C406 C410 CV13 CV15 CV16 CV14	
Q	Q401～Q404 QV01 Q405 QV02	Q
L－S	L401 L402 S401	L－S

COMPONENT SIDE VIEW

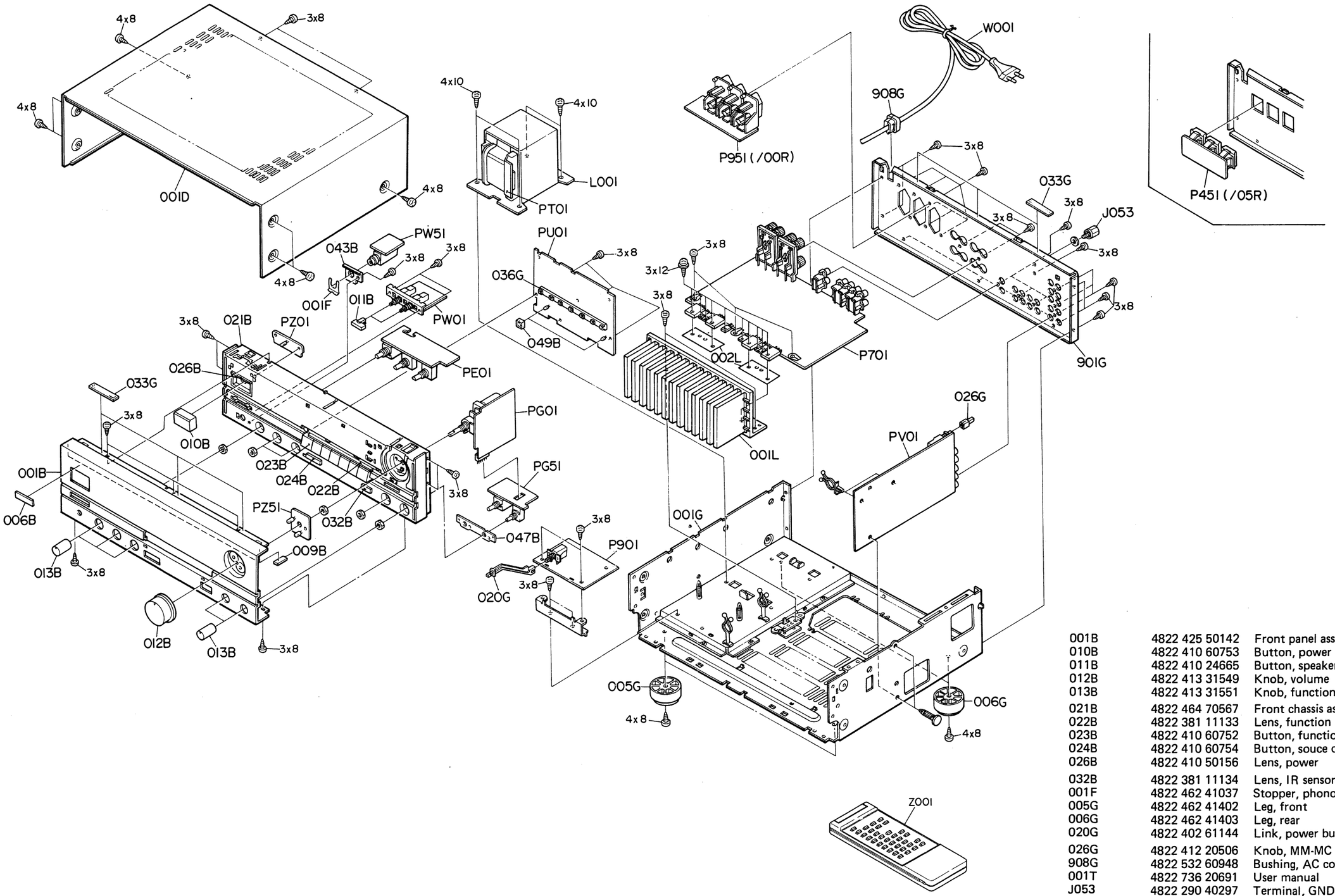


WIRING DIAGRAM

R	RZ51~RZ53		RZ01~RZ04		R901			R
C					C902 C901			C
D					D902 D901			D
F-L-S-V	VZ52	VZ51	VZ01	F902	L901	F901 S901	L001	F-L-S-V



EXPLODED VIEW



001B	4822 425 50142	Front panel assembly
010B	4822 410 60753	Button, power
011B	4822 410 24665	Button, speaker
012B	4822 413 31549	Knob, volume
013B	4822 413 31551	Knob, function
021B	4822 464 70567	Front chassis assembly
022B	4822 381 11133	Lens, function
023B	4822 410 60752	Button, function
024B	4822 410 60754	Button, souce direct
026B	4822 410 50156	Lens, power
032B	4822 381 11134	Lens, IR sensor
001F	4822 462 41037	Stopper, phono jack
005G	4822 462 41402	Leg, front
006G	4822 462 41403	Leg, rear
020G	4822 402 61144	Link, power button
026G	4822 412 20506	Knob, MM-MC
908G	4822 532 60948	Bushing, AC cord
001T	4822 736 20691	User manual
J053	4822 290 40297	Terminal, GND
L001	4822 146 21378	Power transformer
Z001	4822 218 10359	Remote control, RC890

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QG02	4822 130 62386	JC557B
QG03	4822 130 43819	2SC2878
QG04	4822 130 43819	2SC2878
QG05	4822 130 62295	JC547B
QN02	4822 130 62386	JC557B
QN03	4822 130 43377	2SD863(E)
QN04	4822 130 43233	2SC2240 (GR, BL)
QN21÷QN22	4822 130 43233	2SC2240 (GR, BL)
QN23	4822 130 42951	2SA970 (GR, BL)
QU03	4822 130 62295	JC547B
QU04	4822 130 62295	JC547B
QU05	4822 130 62295	JC547B
QU06	4822 130 61227	DTA114ES
QU07	4822 130 82139	IR sensor
Q401÷Q404	4822 130 42839	2SK369(BL)
Q701	4822 130 42951	2SA970 (GR, BL)
Q702	4822 130 42951	2SA970 (GR, BL)
Q703÷Q706	4822 130 43233	2SC2240 (GR, BL)
Q707	4822 130 42951	2SA970 (GR, BL)
Q708	4822 130 42951	2SA970 (GR, BL)
Q709	4822 130 60526	2SD1508
Q710	4822 130 60526	2SD1508
Q711	4822 130 60525	2SC3298 (O, Y)
Q712	4822 130 60525	2SC3298 (O, Y)
Q713	4822 130 61358	2SA1306 (O, Y)
Q714	4822 130 61358	2SA1306 (O, Y)
Q715	4822 130 60116	2SC3280 (R, O)
Q716	4822 130 60116	2SC3280 (R, O)
Q717	4822 130 60109	2SA1301 (R, O)
Q718	4822 130 60109	2SA1301 (R, O)

DN01	4822 130 80839	S5688G
DN02	4822 130 80839	S5688G
DN03÷DN05	4822 130 33305	1SS176 (MA165, 1SS254)
DN21	4822 130 80837	HSS81
DN22	4822 130 80837	HSS81
DU01÷DU09	4822 130 80326	LT3D8B
DU10÷DU12	4822 130 33305	1SS176 (MA165, 1SS254)
DU13÷DU15	4822 130 80839	S5688G
DU16	4822 130 31554	MTZJ4.3B
DU17	4822 130 33305	1SS176 (MA165, 1SS254)
D701	4822 130 80273	RD8.2JB2 (MTZJ8.2C)
D702	4822 130 80322	RD15JB1 (MTZJ15B)
D703÷D706	4822 130 33305	1SS176 (MA165, 1SS254)
D801	4822 130 30984	S5VB20
D802÷D809	4822 130 80839	S5688G
D901	4822 130 33305	1SS176 (MA165, 1SS254)
D902	4822 130 33305	1SS176 (MA165, 1SS254)

QE01÷QE03	4822 209 83631	NJM4558DD
QG01	4822 209 62784	TC9215P
QN01	4822 209 83312	TA7317P
QU01	4822 209 62424	LC6554H-4342
QU02	4822 209 73287	LB1630
QV01	4822 209 72748	LC7821
QV02	4822 209 72748	LC7821
Q405	4822 209 73064	NJM2068DD
Q719	4822 209 83732	AN7062P
Q801	4822 209 82829	NJM78M15A

Q802	4822 209 61526	NJM79M15A
Q803	4822 209 62423	NJM78M06A
Q804	4822 209 82829	NJM78M15A

LN01	4822 280 91103	Relay /00R
LN02	4822 280 91103	Relay /00R
LN03	4822 280 20196	Relay
L401	4822 158 60606	Choke coil 20 µH /00R
L402	4822 158 60606	Choke coil 20 µH /00R
L701	4822 157 51739	Speaker coil
L702	4822 157 51739	Speaker coil
L901	4822 280 20222	Relay

RE21	4822 100 30136	Potm. bass 20k(W)
RE22	4822 100 30136	Potm. treble 20k(W)
RG01	4822 100 30137	Potm. volume 50k/0.5k 4 gang-M
RG55	4822 100 30135	Potm. balance 100k(MN)
RN11	4822 113 90141	Res. fuse 220(E) 1/4W
RN17	4822 113 90141	Res. fuse 220(E) 1/4W
RW01	4822 111 50474	Res. wirewound 330(E) 1W
RW02	4822 111 50474	Res. wirewound 330(E)1W
R409	4822 111 90731	Res. safety 47(E) 1/4W
R410	4822 111 90731	Res. safety 47(E) 1/4W
R417÷R420	4822 116 81354	Res. metal film 2.21k 1/6W
R721÷R724	4822 050 26809	Res. metal film 68(E) 1/6W
R733	4822 100 20681	Potm. trimmer 2.2k
R734	4822 100 20681	Potm. trimmer 2.2k
R735÷R738	4822 111 90731	Res. safety 47(E) 1/4W
R739	4822 050 22202	Res. metal film 2.2 kΩ 1/6W
R740	4822 050 22202	Res. metal film 2.2 kΩ 1/6W
R741÷R744	4822 111 91291	Res. safety 10(E) 1/6W
R745	4822 116 60319	Res. met. oxide 220(E) 1/2W
R746	4822 116 60319	Res. met. oxide 220(E) 1/2W
R747÷R750	4822 116 52348	Res. metal film 2.2(E) 1/4W
R751	4822 116 82049	Res. metal film 0.18(E) x 2 3W
R752	4822 116 82049	Res. metal film 0.18(E) x 2 3W
R753	4822 111 91291	Res. safety 10(E) 1/6W
R754	4822 111 91291	Res. safety 10(E) 1/6W
R764	4822 053 10682	Res. metal film 6.8k 1W
R801	4822 050 21108	Res. metal film 1(E) 1/2W
R802	4822 050 21108	Res. metal film 1(E) 1/2W
R803	4822 115 90166	Res. fuse 10(E) 1/4W
R901	4822 111 91291	Res. safety 10(E) 1/6W

CU05	4822 124 23295	Cap. elect 0.022 µF 5.5V
C803	4822 124 41296	Cap. elect 8200 µF 63V
C804	4822 124 41296	Cap. elect 8200 µF 63V
C901	4822 122 33276	Cap. ceramic 0.01 µF
C902	4822 122 33276	Cap. ceramic 0.01 µF

SE01	4822 273 80336	Rec select
SG51	4822 273 20307	Loudness
SU01÷SU08	4822 276 12455	Function
SW01	4822 276 12506	Speaker select
S401	4822 276 20468	Phono select
S901	4822 276 12924	Power

MISCELLANEOUS

F901	4822 253 40166	Fuse T2.5A 250V
F902	4822 253 40166	Fuse T2.5A 250V /00R
JJ01	4822 267 20353	Jack 4P RCA pin
JJ02	4822 267 20353	Jack 4P RCA pin
JJ03	4822 266 30274	Jack 2P RCA pin
JV01	4822 265 30587	Jack 4P RCA pin
JV02	4822 265 30836	Jack 6P RCA pin
JW51	4822 267 31017	Jack headphone
J021		Jack AC outlet /05R
J022		Jack AC outlet /05R
J023		Jack AC outlet /05R
J704	4822 266 30279	Terminal speaker
J705	4822 266 30281	Terminal speaker
J951÷J953	4822 267 31194	Jack AC outlet /00R
VZ01	4822 134 40886	Lamp 75 mA 12V
VZ51	4822 134 40886	Lamp 75 mA 12V
VZ52	4822 134 40886	Lamp 75 mA 12V
XU01	4822 242 72223	Ceramic resonator 4.00 MHz